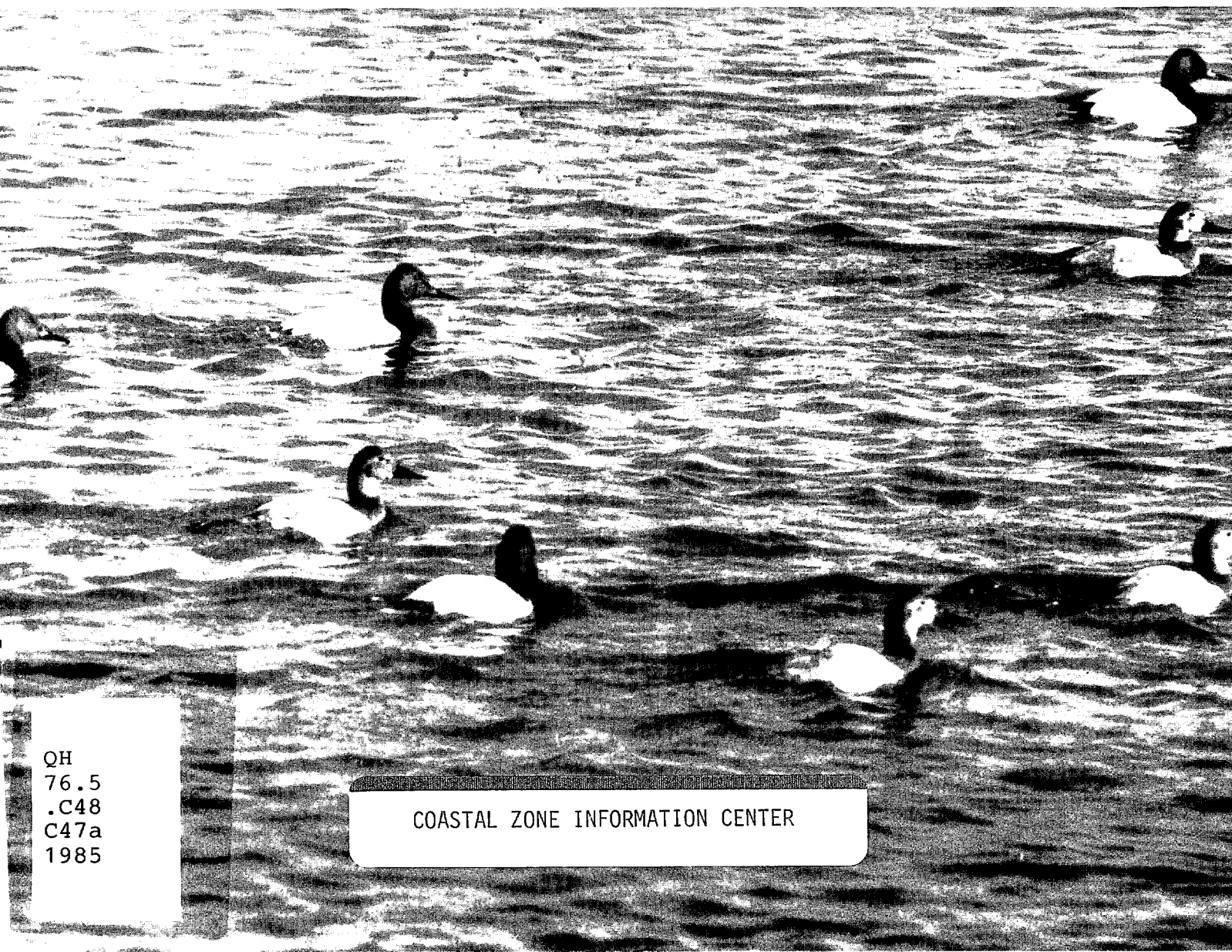


**Chesapeake Executive Council**

**FIRST ANNUAL  
PROGRESS REPORT  
under the  
CHESAPEAKE BAY AGREEMENT**

**December 1985**



QH  
76.5  
.C48  
C47a  
1985

COASTAL ZONE INFORMATION CENTER

---

# CANVASBACK

---

The Canvasback duck is a species of waterfowl that has been adversely affected by the water quality deterioration of Chesapeake Bay. No other species is as uniquely associated with the Chesapeake estuary as this elegant waterfowl. Half of the entire population winters in the Atlantic Flyway, and 50% of those birds in the Bay.

The population of this species has decreased substantially since the 1930s. Then hundreds of thousands of Canvasbacks commonly occurred in the Susquehanna flats and other freshwater Bay areas rich with submerged aquatic vegetation (SAV).

The Canvasback's fame was established early in America's history as a epicurean delight. Historically market demand promoted wanton slaughter. It is believed that the species received its common name not from the color of its back, which is white, but from how it was delivered to market — in canvas bags with the word "back" stenciled on them, a note to purchasers to return the bags to the market hunters.

Canvasbacks on the Chesapeake are no longer threatened by market hunters. However, their abundance and distribution on the Bay, along with many other species of waterfowl, has changed considerably. Canvasbacks are vulnerable to climatic changes, habitat destruction and alteration, predation and estuarine pollution. Population decreases occur rapidly, and the species abundance needs to be closely monitored.

Canvasbacks and other species of waterfowl in the Bay depended highly upon SAV for food. Until recently, wildcelery was the preferred SAV for Canvasbacks on the Bay. The scientific name of the Can — *Aythya valisineria* — is taken from the scientific name for wildcelery, *Vallisneria spiralis*. The abundance of SAV in the Bay decreased dramatically in the early 1970s primarily because of nonpoint pollutants, particularly excessive sediment and nutrients.

Some Canvasbacks moved south to feed in the SAV-rich back bays of North Carolina. Others remaining in the Bay changed from a customary diet of SAV to a diet consisting mainly of small Baltic *Macoma* clams.

The Canvasback still remains the most abundant Bay waterfowl, although its abundance is a fraction of its historic numbers. Other species of waterfowl that relied upon SAV in the Bay, especially the Redhead, northern Pintail and the American Wigeon, have become rare on the Bay. They were less able than the Canvasback to adapt to other food sources.

The reduced populations of these waterfowl are evidence of the degraded water quality in the Bay. With improved water quality generated by expected reductions in nutrients and sediment, we can expect a return of SAV so important to waterfowl. It will be a monumental task, but worth the effort.

**Cover: The Canvasback, photo  
courtesy of the U.S. Fish & Wildlife  
Service.**

**Additional copies may be obtained from:  
Chesapeake Bay Program Office  
410 Severn Avenue  
Annapolis, Maryland 21403**



U. S. DEPARTMENT OF COMMERCE NOAA  
COASTAL SERVICES CENTER  
2234 SOUTH HOBSON AVENUE  
CHARLESTON, SC 29405-2413

## **CONTENTS**

<b>INTRODUCTION</b>	1
Background	1
Study Summary	3

<b>WORKING TOGETHER UNDER THE CHESAPEAKE BAY AGREEMENT</b>	4
Coordination and Management	4
Roles and Responsibilities	6

<b>PROGRAMS TO CLEAN UP THE BAY</b>	7
Grants	7
Jurisdictional Initiatives	8

<b>SUPPORT ACTIVITIES</b>	13
Monitoring	13
Modeling and Research	16
Data Management	17
Chesapeake Bay Restoration and Protection Plan	18
Citizen Participation	19

<b>FEDERAL INTERAGENCY COORDINATION</b>	21
<b>OUTLOOK</b>	22

OH76-5-C48 C47a 1985  
12903351

MAR 6 1997

---

## FOREWORD

---

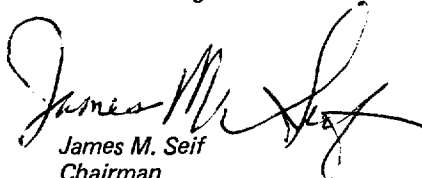
UNIVERSITY OF CALIFORNIA LIBRARY

### TO THE SIGNATORS OF THE CHESAPEAKE BAY AGREEMENT AND THE PEOPLE OF THE BAY BASIN:

*The Chesapeake Bay Agreement was signed in December of 1983. Since then we have made significant strides. A cooperative state and federal structure has been established, as called for in the Agreement. More importantly, we have completed the first Chesapeake Bay Restoration and Protection Plan, which outlines present and future state and federal actions to improve the water quality of the Bay. We have underway coordinated water quality monitoring programs which will help us gauge our progress while maintaining our vigilance in those areas which are presently environmentally sound.*

*Next year we will start reporting on the water quality conditions of the Bay and its tributaries, while we continue working with the agricultural community on nonpoint source pollution control programs on the farmlands of the Basin. This program should aid the farmer by reducing the amount and the cost of fertilizer which, in turn, will improve the basin streams, and in time, enhance the waters of Chesapeake Bay. We will work to define the specific relationships between remedial measures available to us and their expected effects on the water quality and living resources of the Bay. Upon these efforts we can develop sound policy recommendations for future pollution control. Finally, we will maintain and improve the institutional structure and nurture the successful working relationships which were strengthened in 1984-85.*

*This year's report discusses the status of the Bay Agreement and the programs in place to restore and protect the Bay and its tributaries. Future reports by the Executive Council will discuss more about the state of the Bay and our progress in reducing pollution loads to the Bay. It took many decades to degrade the Bay; it will take years to restore it. Our work has only started, but we have made an excellent beginning buoyed by the cooperation and optimism that we will achieve the goals of improved water quality and a revitalization of the living resources in the Chesapeake Bay.*



James M. Seif  
Chairman  
Chesapeake Executive Council

---

# INTRODUCTION

## BACKGROUND

In September 1983 the United States Environmental Protection Agency (EPA) published the results of its seven year study of the Chesapeake Bay. The findings were alarming to the public as well as to political leaders, federal and state governments. It was obvious to all that if the resource was to be saved, action had to be taken immediately.

On December 7-9, 1983, over 700 people gathered in Fairfax, Virginia at a conference convened by the Governors of Virginia, Maryland and Pennsylvania, the Mayor of the District of Columbia, the EPA Administrator and the Chesapeake Bay Commission. Together the sponsors set forth and committed themselves to achieve the following goals:

- To improve and protect the water quality and living resources of the Bay System.
- To accommodate growth in an environmentally sound manner.
- To assure a continuing process of public input and participation on regional issues of Bay management.
- To support and enhance a regional, cooperative approach toward Bay management.

To provide the mechanisms and organizational framework necessary to implement coordinated, cooperative clean-up programs, the conference sponsors signed the Chesapeake Bay Agreement.

## ***The Chesapeake Bay Agreement of 1983***

*We recognize that the findings of the Chesapeake Bay Program have shown an historical decline in the living resources of the Chesapeake Bay and that a cooperative approach is needed among the Environmental Protection Agency (EPA), the State of Maryland, the Commonwealths of Pennsylvania and Virginia, and the District of Columbia (the States) to fully address the extent, complexity, and sources of pollutants entering the Bay. We further recognize that EPA and the States share the responsibility for management decisions and resources regarding the high priority issues of the Chesapeake Bay. Accordingly, the States and the EPA agree to the following actions:*

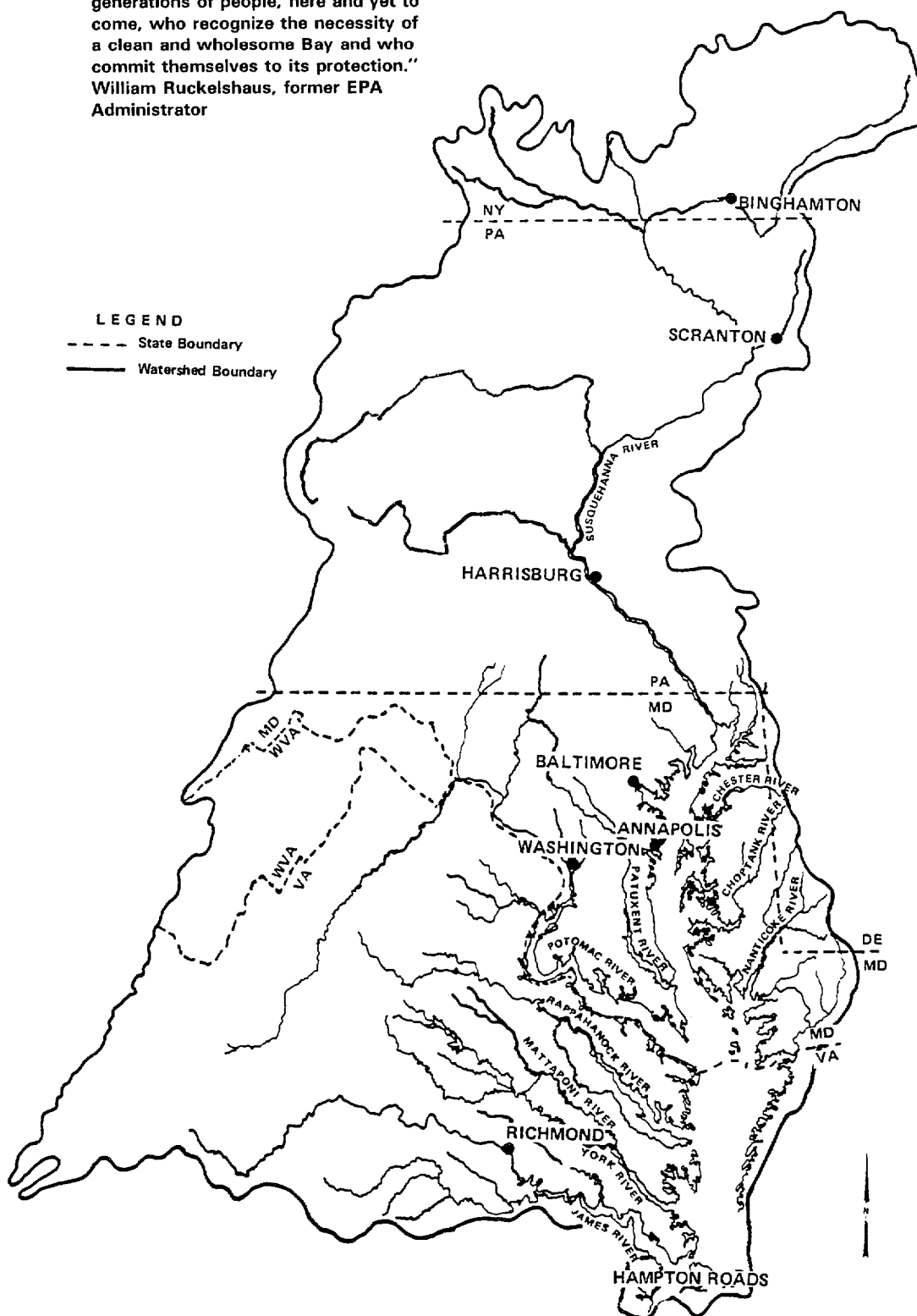
*1. A Chesapeake Executive Council will be established which will meet at least twice yearly to assess and oversee the implementation of coordinated plans to improve and protect the water quality and living resources of the Chesapeake Bay estuarine system. The Council will consist of the appropriate Cabinet designees of the Governors and the Mayor of the District of Columbia and the Regional Administrator of EPA. The Council will be initially chaired by EPA and will report annually to the signatories of this Agreement.*

*2. The Chesapeake Executive Council will establish an implementation committee of agency representatives who will meet as needed to coordinate technical matters and to coordinate the development and evaluation of management plans. The Council may appoint such ex officio nonvoting members as deemed appropriate.*

*3. A liaison office for Chesapeake Bay activities will be established at EPA's Central Regional Laboratory in Annapolis, Maryland, to advise and support the Council and committee.*

# CHESAPEAKE BAY DRAINAGE BASIN

"The Chesapeake Bay is ancient and abiding. Its future is in the hands of generations of people, here and yet to come, who recognize the necessity of a clean and wholesome Bay and who commit themselves to its protection."  
William Ruckelshaus, former EPA Administrator



## STUDY SUMMARY

The Chesapeake Bay Program findings clearly indicated that the Bay is an ecosystem in decline. The Bay's ecosystem is complex and difficult to understand, but some of the links between problems and their causes became clear in the course of the EPA study.

Polluting activities occurring throughout the drainage basin affect water quality in tributary streams and the Bay. Degradation of the Bay's water and sediment quality in turn can affect living resources. Declines in living resources are paralleled by changes in water quality which include increases in nutrient concentrations, chlorophyll *a*, turbidity, and toxic chemicals, and decreases in dissolved oxygen.

A summary of the trends follows:

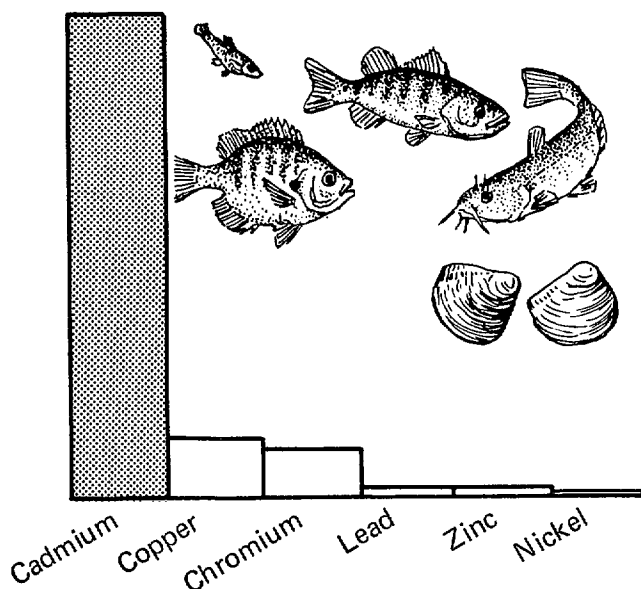
- Submerged aquatic vegetation (SAV), which provides protective cover and food for diverse Bay organisms, has declined in abundance since the 1960s.
- Oyster spat set has declined significantly over the last decade.
- Landings of freshwater spawning finfish have decreased recently.
- Levels of nutrients are increasing in many areas of the Bay.
- The amount of Bay water showing low dissolved oxygen levels in the summer has increased about 15-fold in the past 30 years.
- High concentrations of toxic organic compounds are found in the bottom sediments of the Bay near major industrial facilities.

- In many areas of the Bay heavy metals concentrations in the water column and sediments are significantly higher than natural levels. (See figure below.)

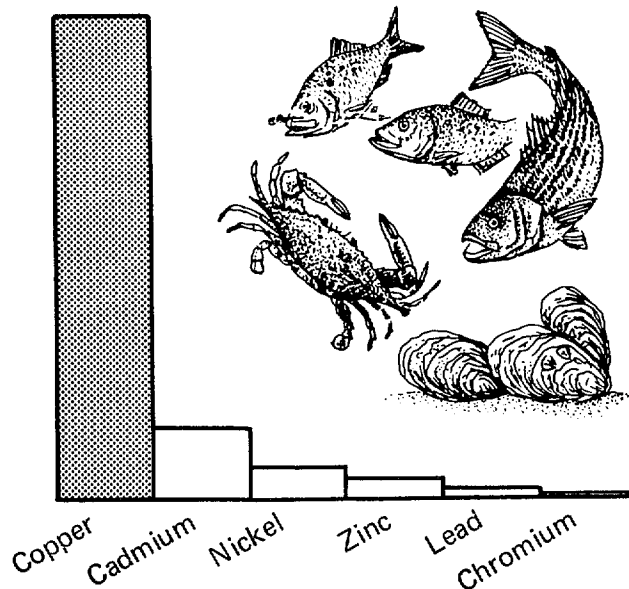
The Chesapeake Bay Program recommended actions necessary if we are to preserve and restore the Bay. The list follows and, at the end of each recommendation is a number referencing the page in this report where progress is reported.

- The states and EPA develop a basinwide plan, including implementation schedules to control nutrients and toxic substances from both point and nonpoint sources. (18)
- NPDES permits should consider Bay Program findings on nutrients and toxic substances and limitation in the permits should be enforced. (9,11)
- EPA and USDA need to work together to reduce agricultural pollution. (21)
- Required pretreatment programs must be implemented. (9,11)
- Toxic compounds must be kept out of the estuary to the maximum extent possible. (8,12)
- Techniques to reduce phosphorus and nitrogen loadings to the Bay should be evaluated and implemented where they are appropriate. (7,12)
- A coordinated Baywide monitoring plan must be initiated. (13)
- A coordinated mechanism should ensure that government takes appropriate actions to reduce pollution of the Bay. (4,21)

### Toxicity in Freshwater



### Toxicity in Saltwater



# WORKING TOGETHER TO CLEAN UP THE CHESAPEAKE BAY

## COORDINATION AND MANAGEMENT

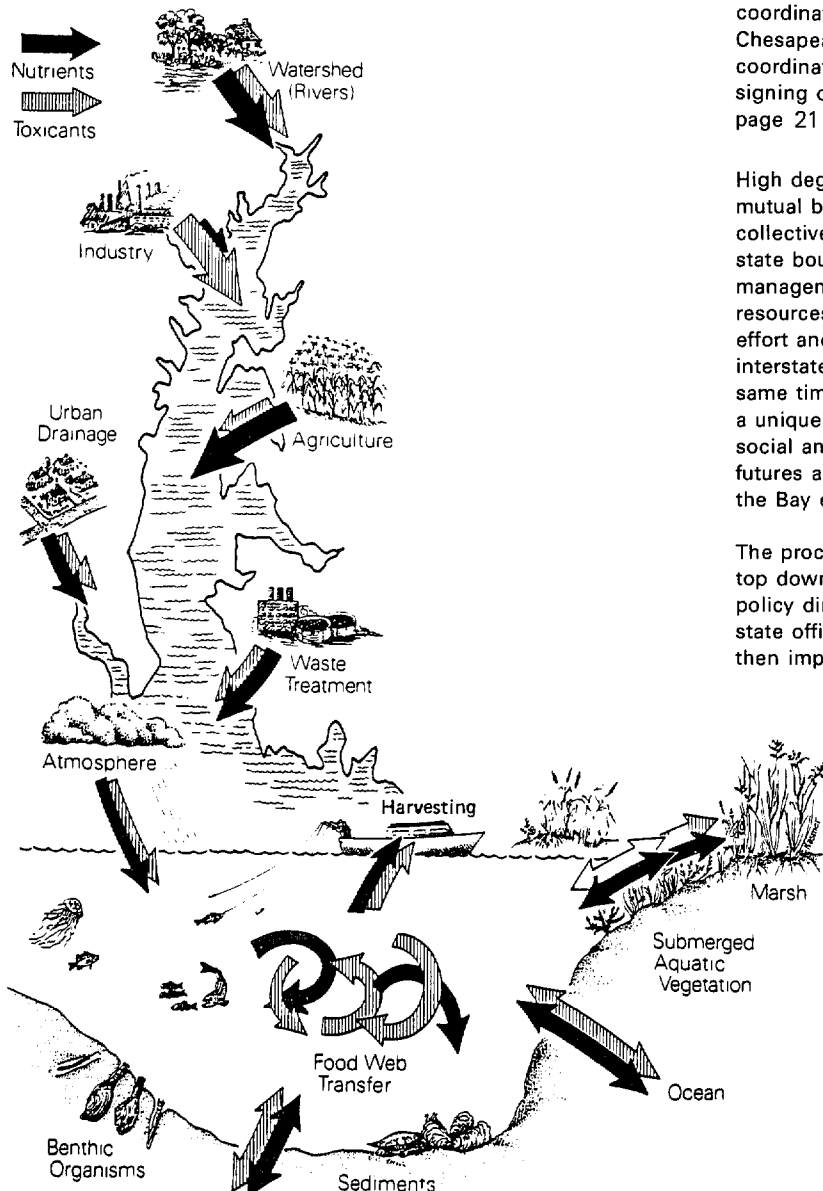
For Chesapeake Bay 1983 was a year of reckoning, decisions and promises. In 1984 state and federal governments took action. At the federal level President Ronald Reagan mentioned the Chesapeake Bay as a "special national resource" in his State of the Union message and pledged \$10 million a year for four years to enhance clean-up efforts. The three state legislatures concluded their own intensive reviews of Bay problems, passed legislation and approved necessary budgets to greatly accelerate state restoration and protection programs. (See page 8 .)

Maryland, Virginia, Pennsylvania and the District of Columbia all have expressed long term commitments to the Bay clean-up. It is and will continue to be these jurisdictions which provide the leadership and the majority of the dollars that pay for water quality and living resources rehabilitation programs.

The structure of cooperation was established in 1984. The Executive Council, Implementation Committee, its subcommittees and two advisory boards were formed and began meeting and planning their work. (See Figure following.) The Chesapeake Bay Liaison Office was set up to coordinate and support the activities of the Chesapeake Bay Agreement groups. Federal coordination was also formalized through the signing of special cooperative agreements. (See page 21 .)

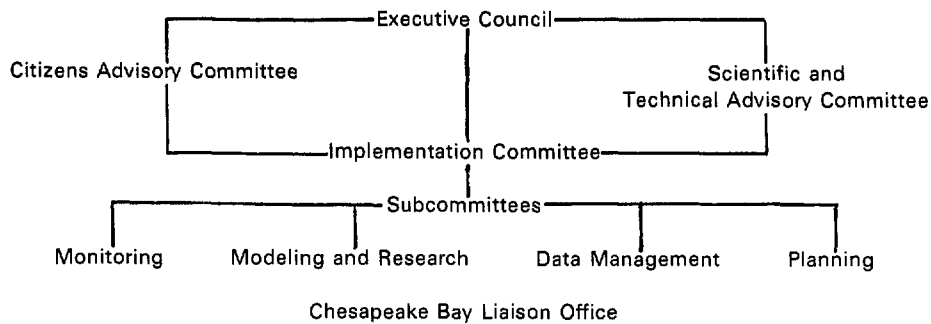
High degrees of mutual trust and recognized mutual benefits are essential ingredients in the collective management of resources that cross state boundaries. The structure established for the management of the Chesapeake Bay and its resources recognizes the voluntary nature of the effort and seeks to capitalize on proven methods of interstate coordination and cooperation. At the same time, it recognizes that the jurisdictions have a unique history of partnership and an intertwined social and economic bond with the Bay. Their futures are dependent on the successful recovery of the Bay ecosystem and its productivity.

The process of cooperation works both from the top down and from the bottom up. In the first case, policy directives are issued through the elected state officials to cabinet officers. The directives are then implemented and coordinated at a staff level



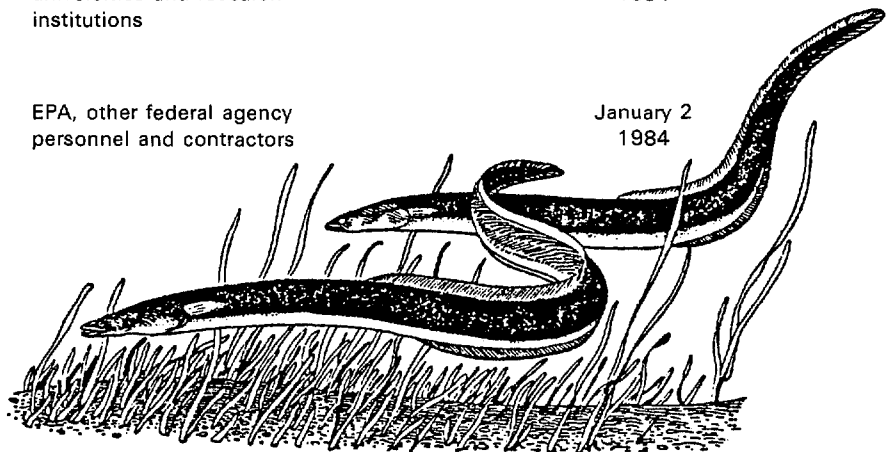
**"I trust the Bay to do its part in recovery if we do ours. The tough thing will be to make certain that we are steadfast, year after year, decade after decade. The start we have made is cause for optimism."**  
**William Ruckelshaus, former EPA Administrator**

## CHESAPEAKE BAY PROGRAM MANAGEMENT STRUCTURE



**TABLE 1 - THE STRUCTURE OF COOPERATION**

Group	Membership	First Meeting
Executive Council	Region III Administrator & State Cabinet level officials	January 25 1984
Implementation Committee	Water Division Director - EPA Agency heads - states/D.C.	February 28 1984
Monitoring Subcommittee	Government & research groups performing monitoring	April 26 1984
Data Management Subcommittee	Federal & state government, Bay Program computer contractor	May 2 1984
Modeling & Research Subcommittee	State & federal government and university researchers	May 3 1984
Planning Subcommittee	Government planners	September 24 1984
Interagency Agreements	EPA and 6 federal agencies	September & November 1984
Citizen Advisory Committee	4 citizen representatives/ jurisdiction + 9 at-large	December 13 1984
Scientific & Technical Advisory Committee	Up to 4/jurisdiction - from universities and research institutions	December 13 1984
Chesapeake Bay Liaison Office	EPA, other federal agency personnel and contractors	January 2 1984



through state agencies. In the second case, the public and users of the Bay have direct access to the Executive Council. They can and do voice concerns and provide recommendations for action in the cleanup effort to the Council.

The Executive Council was established "to assess and oversee the implementation of coordinated plans to improve and protect the water quality and living resources of the Chesapeake Bay estuarine system." It is effective because the nine cabinet level members of the Council have the authority to make or change policy affecting the Bay. The Council members report directly to the Governors and the Mayor of the District of Columbia, the Administrator of the Environmental Protection Agency, and ultimately to the public of the region.

The Council serves the Bay public in at least two broad areas. First, the Council reviews and evaluates the activities of each jurisdiction as detailed in the Chesapeake Bay Restoration and Protection Plan (See page 18.) to ensure that they are compatible with the overall efforts and are targeted to achieve the common goals and objectives. Second, the Council and its actions are a positive influence within each jurisdiction because they focus attention on the importance of Bay clean up efforts and activities, and ensure that the activities are sufficient to address the issues facing the Bay region and its people.

The Implementation Committee carries out the directives of the Executive Council. The Committee is the focal point for managing all activities which support Bay restoration and protection. These activities include providing direction and guidance to its various subcommittees, and utilizing the expertise and unique perspectives/skills of members from those groups as well as those of their advisory groups from the scientific and technical community and the public.

## ROLES AND RESPONSIBILITIES

EPA is the communication hub for all Chesapeake Bay Agreement governmental activities. The data center for Bay information is in the Liaison Office. Bay related federal grants management is also performed from that office. EPA Region III Water Management Division staff have begun their program integration work, efforts to meld and focus air, hazardous waste, water, and other programs of EPA in a manner that will not only be in keeping with mandates, but will also maximize benefits for Bay resources.

Industry has made great strides in reducing the point source problems of the Bay, but still more can be done through pretreatment of wastes sent to treatment plants, improvements in manufacturing and waste management processes and adherence to discharge permit conditions.

State and local governments and the private sector have an important role to play in Bay rehabilitation. Nonpoint sources of pollution contribute a large proportion of the nutrients, organic chemicals, heavy metals and silt to the Bay. The Bay states

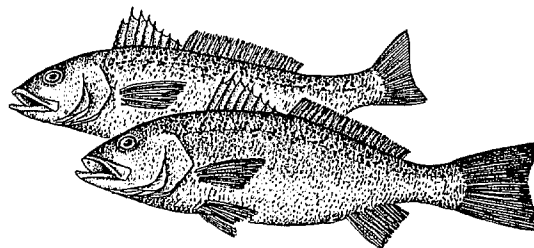
and their local governmental units are developing programs to control runoff. Program components include education, demonstration projects, financial and technical assistance, regulations, research and monitoring.

Local governments have the power to control much of the runoff through planning, zoning ordinances, and other local ordinances and programs. Local governments' programs can be used to manage growth and minimize the consequences of land modifying activities such as construction, thus complementing state-directed efforts.

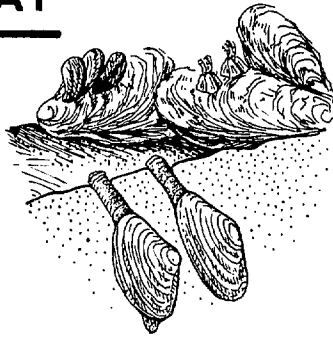
Farmers in the drainage basin are critical to the Bay's recovery. Much of the phosphorus and nitrogen reaching the Bay is draining off croplands or is attached to eroded soil from agricultural land. By voluntarily changing their tillage, cropping, chemical application, manure storage and water management practices, farmers can preserve their valuable topsoil and reduce the pollution of the Bay.

It is the role of the citizens and the media of the Bay Region to become informed and as active as possible in maintaining the political will necessary to support the federal, state and local programs which are required to assure the recovery of Chesapeake Bay. Everyone can be involved in some way through voluntary efforts on personal property, active group or individual participation in decision making processes that affect the Bay, and expressions of concern through media and political channels. Federal and state government agency programs of information and participation are or will be providing the necessary information and access to citizens and the media.

A procedure for public accountability is built into each jurisdiction's planning and budgeting process. Another avenue for access, review and accountability will be built into the Chesapeake Bay Restoration and Protection Plan revision process. Accountability is linked to the Chesapeake Bay monitoring and modeling programs in that they will provide the indications of success or failure in cleaning up the Bay. When the implementation phase of the Bay Program is sufficiently mature to measure the effectiveness of control strategies, both the public and Bay managers will have ample opportunity to assess the options for continuing with the ongoing activities or modifying the approaches to management of Bay water quality and living resources problems.



# PROGRAMS TO RESTORE AND PROTECT THE BAY



## 1984 GRANTS

### District of Columbia

The United States Environmental Protection Agency awarded the District of Columbia a \$228,000 grant to initiate projects essential for controlling its urban nonpoint source pollution problems.

Presently, the District has no stormwater regulatory program to control new development or redevelopment after construction. The grant will be used to support development of stormwater regulations requiring best management practices (BMPs) at construction sites, a BMPs manual to complement the regulations, and a home owners BMP guidebook.

Implementation of BMPs required by the proposed stormwater control program will reduce the amount of heavy metals in runoff, reduce nutrient loads of nitrogen and phosphorus, smooth out the storm hydrograph, reduce bank erosion and scour, increase aquifer recharge and provide better aquatic habitat. These regulations and publications will not only function to reduce loadings of pollutants, but will also improve public understanding of the need to abate nonpoint source pollution.

### Maryland

EPA awarded the State of Maryland \$875,000 to begin five Chesapeake Bay projects. In selecting projects to be funded by the grant, Maryland focused on activities which are not funded and supported by state funds and which have high potential to be implemented in many other locations around the Bay.

The State Highway Administration will receive \$200,000 to implement stormwater control practices on Route 2 and portions of Route 50 between Route 2 and the Bay Bridge. This highly visible area will showcase projects that slow the velocity of stormwater runoff, reduce bank erosion and help control sediment and toxic pollution.

With its \$200,000 grant the City of Baltimore will treat the first flush of stormwater which carries high concentrations of pollutants. The stormwater will be diverted to remote park areas where it will be treated by infiltration. This process will reduce discharges of nutrients and sediment into Gwynns Falls, Jones Falls and the Inner Harbor.

**"These (EPA grant) projects are tangible evidence of the federal commitment to assist in the restoration of the Bay."**

**Harry Hughes, Governor of Maryland**

Anne Arundel County will receive \$160,000 to reduce sediment loads in the Little Patuxent River through four stormwater retrofit projects. Queen Anne's County Soil and Water Conservation District will receive \$225,000 to reduce shoreline erosion on Wye Island and protect aquatic life from the smothering effects of sediment pollution. The grant will be used to prevent trees from falling into the water and dislodging sediment, and to plant vegetation to stabilize the shoreline.

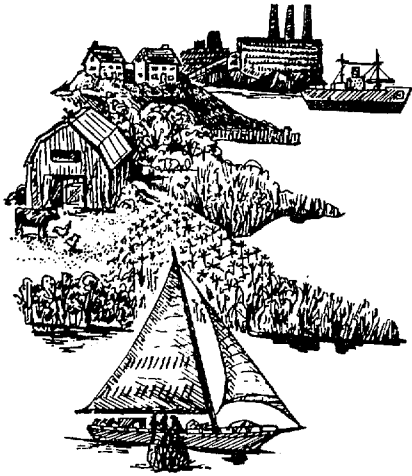
A \$90,000 grant will be used to construct vessel waste pumpout facilities at selected locations with high boat traffic. This project will directly reduce nutrient and bacteria loads to the Bay, and increase the recreational value of Bay waters.

The \$875,000 EPA grant is to be matched with \$1,000,000 in state funds which will be used to demonstrate stormwater retrofit practices in developed areas.

### Virginia

The implementation grant to Virginia is for \$875,000 to supplement agricultural and urban land drainage pollution control programs. Virginia will use this grant to supplement its \$2.5 million program. The Department of Conservation and Historic Resources is offering to cost share with farmers the installation of specific conservation practices. It is establishing a process for determining which are the priority cropland areas where runoff pollution controls are needed most. With the help of EPA funds, the Department will be able to provide more technical assistance and direct financial assistance to farmers, undertake demonstration projects, and conduct better education programs on the benefits of conservation.

While working out the long range strategies for 22,000 square miles that drain to Chesapeake Bay, the Commonwealth will be targeting recognized nonpoint pollution problems in the Rappahanock, York, and Shenandoah river basins and along the Eastern Shore. Cropland pollution control efforts will be intensified in each area except the Shenandoah. There the target will be animal waste management.



An important element in Virginia's program is an innovative demonstration project. One small agricultural watershed has been selected based on its high density agricultural use and on water quality problems which are tied to agricultural sources. Additional resources are being concentrated there to achieve maximum farmer participation and to monitor short and long term effects of BMPs put in place.

## Pennsylvania

The Commonwealth of Pennsylvania initiated a comprehensive agricultural nonpoint source pollution control program with the commitment of \$2 million (\$1 million each in state and federal funds) in its fiscal 1985 budget. The program's goal is to accelerate the implementation of best management practices on agricultural land. It focuses on animal waste and nutrient management. The initial phase targets seven watersheds in the lower Susquehanna River with high livestock density and intensive cropping practices. The program will later be extended to other watersheds.

First year costs will cover planning, technical and financial assistance and education programs. Planning activities include assessment of agricultural pollution, coordination of state agencies' assistance activities to farmers, and monitoring to establish baseline loadings and determine the effectiveness of control programs. Technical assistance provided through a water quality specialist and five nutrient management specialists will result in improved animal waste and commercial fertilizer management practices. In addition, tillage demonstration projects will allow the comparison of yields from different practices and show proper tillage techniques. A pesticides management program will provide information on the proper use of pesticides, and most importantly, innovative pilot projects will stress on and off site use of manure as a resource.

One million dollars in financial assistance is available to assist Pennsylvania farmers implement BMPs to control soil and nutrient loss. Educational programs will help Pennsylvanians understand the

Bay's problems, their contributions to those problems, and what they can do to reduce pollution causing Bay problems. Public participation is an important component of these educational programs. Additional educational programs, particularly directed to farmers, will stress the importance and potential savings from nutrient management.

## JURISDICTION INITIATIVES

### DISTRICT OF COLUMBIA

The keystone of the District's 1983 Chesapeake Bay initiatives was enactment of a comprehensive Water Quality Act. Passed by the District Council in December 1984, it was signed into law in January and went into effect in March 1985. Numerous sets of regulations authorized to implement the Act are being developed and will go into effect over the next two years, including: water quality standards, quality assurances, point source discharges, pretreatment of industrial waste, wastewater treatment plant construction, water quality management planning, sludge management, fisheries management, nonpoint source control, groundwater, dredge and fill permit review, and oil spill prevention and clean up.

Approximately \$360 million in federal, state and local funds will be invested in improvements to the Blue Plains Wastewater Treatment Plant which serves the Washington Metropolitan area. Through increased sewer rates, funds will be provided to improve operation and maintenance of the Blue Plains STP. A Sewer Use Ordinance developed by the District Department of Public Works will be introduced in the District Council in 1985. It will allow the District to prohibit the discharge of many types of wastes into the sewage system. A combined sewer overflow program which includes structural changes in sewer systems and construction of swirl concentrators for the treatment of combined sewer overflows will benefit the Anacostia River and Rock Creek.

Regulations protecting living resources in the Potomac River are to go into effect in 1986. These have been necessitated by improvements in water quality which have encouraged migration of such fish as striped bass, shad, herring and perch to

**"All of us who live in the Chesapeake Bay Region must share the responsibility as stewards for her invaluable resources."**  
**Marion Barry, Mayor, District of Columbia**

District waters, and the use of those waters as nursery grounds. Regulation is expected to be as strict as those in place in neighboring states. The regulatory effort is equally funded by the District with the U.S. Department of Interior.

An oil spill contingency fund and oil spill equipment will enable the District to respond to oil and chemical spills beginning in 1985.

## Maryland

In Maryland the State General Assembly enacted comprehensive environmental legislation that should contribute significantly to the Chesapeake Bay cleanup. Forty new programs were started, 174 positions were created, and \$13.8 million in operating and \$22 million in capital funds were committed.

These initiatives fall into six categories: 1. point sources, 2. nonpoint sources, 3. resource restoration, 4. protection of land resources, 5. resource enhancement, and 6. environmental education. Programs in each of these areas are described below.

The State of Maryland has undertaken a series of initiatives to reduce the effects of point source effluent discharges from waste treatment plants and industry and to enhance enforcement of National Pollutant Discharge Elimination System (NPDES) permit regulations:

- Increased the state share of sewage treatment construction funding so that the local share can remain 12.5% while the federal share decreases;
- Provided grants to publicly owned treatment works to install dechlorination equipment;
- Began identifying state owned lands suitable for sludge disposal and demonstration of the benefits of composting with sewage sludge;
- Initiated demonstrations of innovative and alternative sewage treatment systems;
- Began developing comprehensive programs and regulations to provide more thorough surveillance of effluent dischargers and more stringent prosecution of violators;
- Offered loans to industries to pretreat their wastes prior to discharging them to sewage treatment plants (STPs);
- Improved training and certification of STP operators.

In the area of nonpoint pollution abatement Maryland has undertaken several initiatives to keep the soil and everything on it — toxic chemicals, fertilizer, topsoil, petroleum residues, pesticides — from entering the Bay in amounts large enough to degrade the health of the ecosystem:

- Authorized an additional \$7 million of state funds for agricultural cost sharing;
- Completed BMPs on 628 projects;
- Initiated a program of urban stormwater demonstration grants to abate stormwater pollution in existing developed areas;
- Increased enforcement of stormwater control law that after development runoff rates be similar to pre-development runoff characteristics in order to reduce stream erosion, pollution and local flooding.
- Transferred authority for enforcing sediment and erosion control laws to the state unless counties can demonstrate they can do the job;
- Established rules and regulations requiring efficient design, construction, operation and maintenance of agricultural drainage projects;
- Enhanced efforts to maintain forest buffers;
- Provided construction funds for shoreline erosion control;
- Increased appropriations for the conservation easement program.

In the area of resource restoration, Maryland has begun the following activities to improve the Bay's health and productivity:

- Replanting of submerged aquatic vegetation (SAV);
- Increasing oyster repletion and culture program funds;
- Restoring black duck habitat;
- Using hatcheries to help restore diminished stocks of rockfish, black ducks and oysters.

To implement state, county and local as well as private cooperative programs that protect Maryland's shorelands and wetlands, the state has:

- Created the Critical Areas Commission to protect shoreline areas and inshore waters against further degradation from new land development;
- Established grants to improve shoreline within Chesapeake Bay critical areas or on property owned or intended for acquisition by local government;
- Begun mapping and inventorying forested shoreline;



- Begun developing nontidal wetland mitigation criteria for public drainage associations.

To enhance resource habitats throughout Maryland's Bay watershed and to encourage and develop commercial and sport fisheries, the State has undertaken the following initiatives:

- Development of comprehensive management plans for major Bay fish species;
- Prohibition of all fishing for rockfish in all Maryland waters;
- Establishment of a salt water fishing license that will provide funds for projects to protect, enhance and monitor specific fisheries;
- Establishment of the Maryland Conservation Corps to restore natural resource habitats and to provide employment for disadvantaged youth.

In the area of environmental education Maryland has begun the following programs to teach future generations about the complexity and value of Chesapeake Bay:

- Project direction for environmental education programs;
- Grants to local school systems for environmental education programs and curricula;
- Estuarine field studies program to provide students with first-hand experience of Bay ecology;
- Teacher training program to enhance quality of Chesapeake Bay related instruction.

## Virginia

The 1984 Session of the Virginia General Assembly enacted a number of legislative and budgetary measures designed to improve water quality and living resource management in the Bay. The total Chesapeake Bay budgetary package adopted amounts to more than \$15 million for the 1984-86 biennium. This sum represents the institution of important new programs as well as the expansion of existing programs.

These initiatives fall into five general areas: 1. point source pollution abatement; 2. nonpoint source pollution abatement; 3. resource restoration; 4. management and support; and 5. education and research. In the point source abatement area, the Commonwealth of Virginia has undertaken a series of initiatives to eliminate toxic chlorine discharges from STPs and to improve the handling and treatment of sanitary wastes:

- Provided matching funds (75%) to localities adding dechlorination technologies and (85%) to those adding innovative technologies to their sewage treatment plants;

- Provided matching funds (55%) to localities to repair damaged sewerage lines and interceptor systems to reduce infiltration and inflow, thus preventing treatment plant overloading and raw sewage by-passes;
- Created the Virginia Resources Authority to assist localities in obtaining good rates for financing water and sewer projects.

To encourage the implementation of best management practices that reduce the flow of pollutants from agricultural and urban lands, the Commonwealth has:

- Enhanced state agricultural conservation program to induce farmers to adopt conservation practices with cost share assistance;
- Established a process for identifying priority areas where technical assistance, demonstration projects and education programs will be targeted;
- Hired new staff and began demonstration projects aimed at reducing the flow of sediments, toxic substances and nutrients from urban areas;
- Provided assistance to low income shoreline residents with sanitation deficiencies to repair or install septic tanks and other facilities;
- Began accelerated reopening of condemned shellfish areas through a new integrated multi-agency program that concentrates management resources on those areas with the greatest potential for productivity;
- Established summer employment program for disadvantaged youth to work on Bay clean up projects.

The Commonwealth of Virginia has undertaken the following initiatives to enhance and create resource habitat and to increase stocks of valuable commercial species:

- Began a program to reestablish submerged aquatic vegetation;
- Continued development of a fisheries management unit and fisheries management plans;
- Began development of oyster hatchery for controlled production of seed oysters;
- Increased oyster replenishment effort;

**"The preservation of our soil and water resources must be one of our national priorities. History has shown us that when the soil or water resources of a society diminish, so does that society."**  
Charles S. Robb, Governor of Virginia

- Began construction of artificial reefs for improved sport fishing;
- Began improvements and maintenance of public landings;
- Provided funding to public television station to assist in development of an education series on the Bay;
- Provided funds to allow for expansion of program of Bay field trips for school children being conducted by an environmental foundation.

To improve coordination of monitoring efforts and data management, to enhance computer capabilities within state agencies, and to initiate planning and monitoring programs to evaluate the effectiveness of cleanup efforts, Virginia is:

- Developing and implementing a comprehensive water quality and living resources monitoring program for Chesapeake Bay and its tributaries;
- Implementing a Chesapeake Bay Pilot Toxics Strategy to develop toxic substances detection and analysis capabilities;
- Continuing the James River water quality monitoring program and recalibrating the upper James River wasteload allocation model;
- Monitoring levels of Kepone in the James River;
- Coordinating data base management among state agencies, research institutions, and EPA;
- Enhancing State Water Board computer system;
- Automating the fisheries management data to aid the development of oysters and striped bass;
- Coordinating and monitoring of Bay initiatives by the Council on the Environment;
- Increasing assistance to Marine Patrols Funds to improve enforcement of regulations by local marine police;
- Supporting Chesapeake Bay Commission.

To inform the citizenry of the Bay's importance, problems and solutions, and to expand research directed toward management of the Bay, the Commonwealth of Virginia has undertaken the following programs:

- Chesapeake Bay education grant program;
- Environmental public service announcements;
- Continued support to studies on the human health effects of Kepone contamination;

- Research grants to study factors affecting oyster setting and development and affecting critical finfish populations.

## Pennsylvania

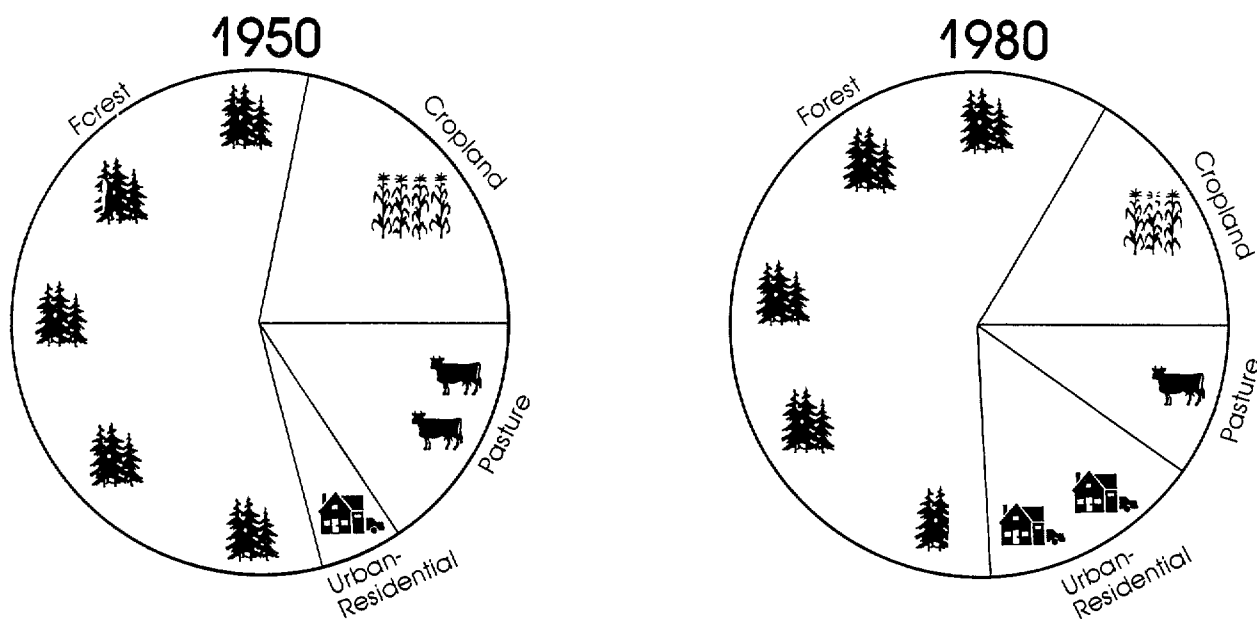
Pennsylvania's major initiative involves the implementation of a \$2 million comprehensive agricultural nonpoint source pollution control program in the Susquehanna River Basin. Details are provided in the previous section. In addition, the state is implementing or has implemented the following initiatives:

- Completed Phase I review of required triennial water quality standards revision process in November 1984 and the Environmental Quality Board approved various revisions in December, 1984. Revised standards which went into effect in February 1985 require that the level of phosphorus control on individual facilities be based on a determination by the Department of Environmental Resources (DER) concerning the specific level of control necessary for that facility. Thus, some point sources to the mainstem or tributaries in the lower Susquehanna River may be required to adopt strategies more stringent than those necessary to achieve the minimum level of phosphorus removal (2mg/l);
- Began the second phase of the water quality standards review process in January 1985 which includes, among other issues, toxic substances;
- Developed a program strategy to address EPA's priority pollutants and to give guidance to the DER in developing NPDES permit effluent limits for toxic pollutants;
- Pretreatment programs are expected to be in place for all 38 municipal dischargers requiring pretreatment within the Chesapeake Bay drainage basin by the end of fiscal year 1986;
- Emphasizing development and implementation of cost effective innovative alternative sewage treatment technologies to meet the needs of rural communities which cannot afford conventional technologies;
- Working with state, federal, interstate agencies and utility companies which run area hydroprojects to restore the American shad and other migratory species to the Susquehanna River Basin;
- Initiating steps to obtain delegation of the federal pretreatment program by the end of FY 1986;
- Developing a striped bass stocking program with Maryland in the Conowingo Pool/Reservoir;

- Expanding program responsibilities/activities under the federally delegated OSM program for correcting abandoned mine land problems which will help improve water quality;
- Instituting educational and technical assistance efforts to encourage comprehensive water conservation programs within the Susquehanna and Potomac river basins to reduce loadings on existing on-lot and sewage treatment and conveyance systems;
- Instituting an environmental education program for secondary students, teachers and the general public concerning pollution and soil and water conservation relative to Chesapeake Bay.
- Conducting an Outreach Operator Training Program under Section 104(g) of the Federal Clean Water Act to improve publicly owned treatment works efficiency and to attain more consistent compliance with NPDES effluent limitations;

**"We want it known that even a distant neighbor can be a good neighbor. We have made gigantic strides during the '80s in cleaning up the Susquehanna. We will continue to do our part."**  
**Dick Thornburgh, Governor of Pennsylvania**

- Instituting a PCB sampling program to sample areas with outstanding fish consumption advisories and to sample major interstate streams as they leave Pennsylvania;
- Implementing a quantitative program of environmental measurements and analysis to assess the nutrient sources and loadings to the mainstem and selected watersheds within the Susquehanna River Basin;
- Seeking primacy to carry out a federally delegated RCRA Program in Pennsylvania by the end of 1985;
- Developing and implementing a comprehensive groundwater quality management program.



**Land use patterns in the Chesapeake Bay drainage basin, 1950 and 1980.** Despite the slight increase in basinwide forested lands, in the area closest to the Bay (below the fall line) forested lands have decreased nearly 4% since 1950. Though cropland and pasture land use has decreased, intensity of cropping and livestock practices has increased.

# SUPPORT ACTIVITIES

## MONITORING

The process of cleaning up Chesapeake Bay will take many years, perhaps decades, and it's likely that sampling will occur for years before trends emerge to reflect what man is doing to restore the Bay. To understand how our remedial actions fit into the complex life of this estuary, with all its natural variations — the seasons, the storms, the droughts — we must monitor the Bay to find out what is going into it and how the Bay reacts. Monitoring, therefore, is vital in our efforts to restore Chesapeake Bay.

In 1984 the Implementation Committee formed the Monitoring Subcommittee to develop and implement a Basinwide, coordinated monitoring plan. While that plan evolved, the Subcommittee served as a forum where present efforts, techniques and problems could be discussed.

In May 1984 the coordinated monitoring effort began. Researchers went out on the Bay measuring dissolved oxygen...monitoring the onset of anoxia, the oxygen poor conditions in bottom waters. In July a full network was in place on the mainstem Chesapeake with fifty stations covering the entire Bay from the Susquehanna Flats to the Virginia Capes. (See map.)

### Mainstem

EPA has a Congressional directive and federal funding to conduct monitoring of the mainstem of the Bay. This is through grants to the States of Maryland and Virginia which, in turn, arrange for sampling and analysis. The mainstem monitoring

network, 22 stations in Maryland waters, 28 in Virginia, samples nineteen ( see Table ) water quality variables from surface to bottom in the water column. In this first year, sediment was collected at all the Maryland and eight of the Virginia stations. Those sediments are being analysed for a number of toxic organic chemicals and heavy metals.

### Tributaries

If the mainstem Chesapeake Bay stood alone, monitoring would be a reasonably easy task. However, the Bay is fed by approximately 150 tributaries. Monitoring includes the tributaries and attempts to account for the impact of both land based and on-the-water activities.

The states monitor the tributary rivers of Chesapeake Bay. The programs are very similar to the mainstem, with the same list of items for which to sample.

Pennsylvania monitors five subbasins in the lower Susquehanna. The District of Columbia monitors the Potomac and Anacostia rivers and several small streams. Maryland has programs in twelve rivers, including a major intensive program in the Patuxent. Virginia has programs in six major rivers, and a special effort in the James.

## CHESAPEAKE BAY MONITORING

### Physical Measurements

Temperature  
Salinity  
Alkalinity  
Secchi Depth  
pH  
Total Suspended Solids

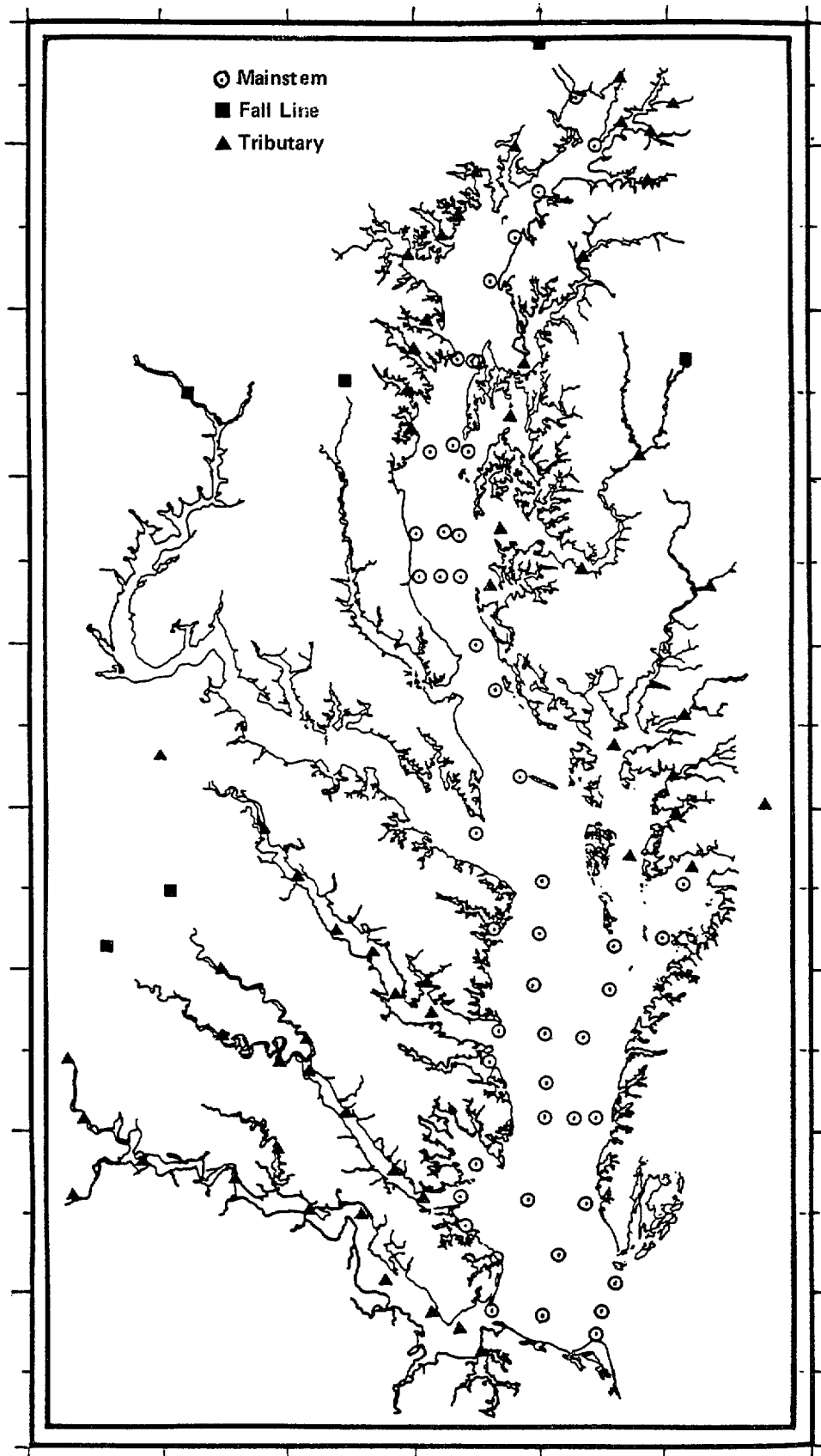
### Water Chemistry

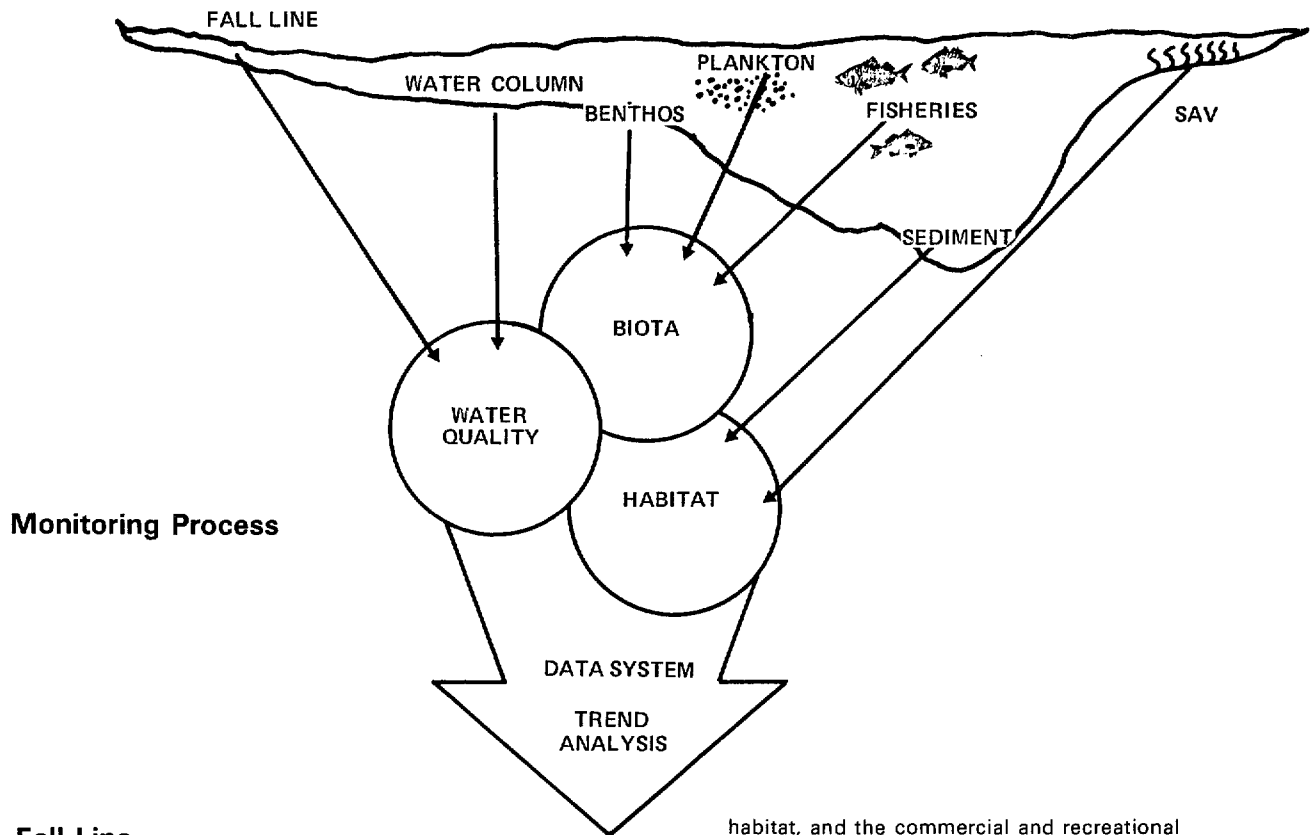
Silicate  
Total Nitrogen  
Nitrate  
Nitrite  
Ammonia  
Total Phosphorus (filtered)  
Total Phosphorus (unfiltered)  
Dissolved Oxygen  
Orthophosphate  
Particulate Organic Carbon  
Dissolved Organic Carbon

### Biological Indicators

Chlorophyll a  
Phaeophytin

# MONITORING STATIONS





## Fall Line

Each of the major rivers changes from a tidally affected (coastal) to a freeflowing (inland fresh water) river at a zone called the fall line. The United States Geological Survey and the jurisdictions work together to operate a fall line sampling network. In addition, all jurisdictions monitor tributaries above the fall lines.

## Living Resources

Those who worry about deteriorating water quality in the Chesapeake Bay do so mainly because of the effects on the living resources. Virginia and Maryland, the states which regulate living resources in the Bay, do the majority of this type of monitoring. Both have quite extensive juvenile fish monitoring and shellfish quality checking programs which have for many years been documenting declining stocks.

These programs will continue and differences among the state programs will be minimized to make the data bases more comparable and help us better interpret patterns from a basinwide perspective. In Maryland waters, where a large portion of striped bass spawn, there is a large continuing effort dealing with that species.

The states are establishing programs on both the mainstem and the tributary rivers to monitor components of the living resources food chain, phytoplankton and zooplankton (the microscopic creatures at the base of living aquatic systems) and the benthos (bottom dwelling organisms which are target prey species for many finfish). These populations may be a link among water quality,

habitat, and the commercial and recreational species of strong interests.

Federal participation in monitoring the Bay's living resources comes mainly from EPA and NOAA. During 1984 EPA funded, through the Monitoring Subcommittee, an aerial survey of submerged aquatic vegetation (SAV) Baywide. SAV was one of the bellweathers which led us to conclude the Bay was in decline. A report is being prepared and it appears that for FY-85, the Corps of Engineers, U.S. Fish and Wildlife Service, the States and EPA will combine resources to repeat much of the project. As part of its National Status and Trends Program, NOAA samples the Bay's benthic (bottom dwelling) populations, fin- and shellfish for potential accumulation of toxic materials. NOAA is working with EPA to assure that these data are compatible with toxics information gathered elsewhere in the monitoring effort. NOAA is assisting the states in assessing the stocks of commercially and recreationally important fish species.

The water quality, biota and habitat data collected in these complex monitoring programs are entered in the computer data base at the Chesapeake Bay Program in Annapolis, and there they are used to determine trends in Bay conditions. The state and federal agencies together determine the methods to be used in sample analysis and quality assurance practices, and together decide to fund studies to refine sampling and analytical techniques. Programs are never static, nor are the choices for methods or interpretation always clearcut or simple. Professionals systemwide are working together to forge and sustain over the long term, a monitoring program which will truly track the Bay's restoration.

## MODELING AND RESEARCH

The Modeling and Research Subcommittee serves as a forum for Chesapeake Bay agencies to develop a coordinated approach towards addressing technical needs of the program. The Subcommittee identifies important technical questions and recommends a course of action to the Implementation Committee.

Specific instructions to the Subcommittee require that it "report to the Implementation Committee on research needs, assure coordination of modeling and research efforts, and seek to integrate those subject areas into the ongoing Chesapeake Bay implementation efforts. The Subcommittee will also provide a mechanism to assure scientific and technical input to the Bay effort."

Since its formation the Subcommittee has worked to provide oversight for ongoing modeling efforts and research projects. An *ad hoc* modeling evaluation group, consisting of nationally recognized experts in mathematical modeling, was convened to advise the Bay Program on modeling needs for management purposes.

The group reviewed Bay Program needs and recommended ways to use models to address them. Members felt that appropriate models would be valuable tools in predicting results from various implementation activities, such as nutrient load reduction, or installation of various best management practices on farm land.

In June 1985, the Implementation Committee accepted the recommendations of the Subcommittee to update, convert and transfer the Watershed Model to the Chesapeake Bay Liaison Office computer. This will enable both the Bay Liaison Office staff and state personnel to analyze the effectiveness of various control strategies in reducing nutrient loadings to the Bay. The Implementation Committee also authorized the development and installation of a predictive mathematical model which will relate these loadings to the problem of nutrient enrichment and low oxygen in the Bay. This steady state model will also assist managers in identifying appropriate nutrient control strategies, including the effectiveness of nitrogen vs. phosphorus controls, point source vs. nonpoint source controls, and basin vs. sub basin controls. In addition, the Implementation Committee directed the Chesapeake Bay Liaison Office to undertake nutrient process studies which will support the development of the model. It is expected that Bay managers will have access to the model to begin assisting with Bay clean up decisions within two years.

The Subcommittee is developing an inventory of ongoing research and technical activities, supported by state and federal agencies, which relate to Bay implementation.

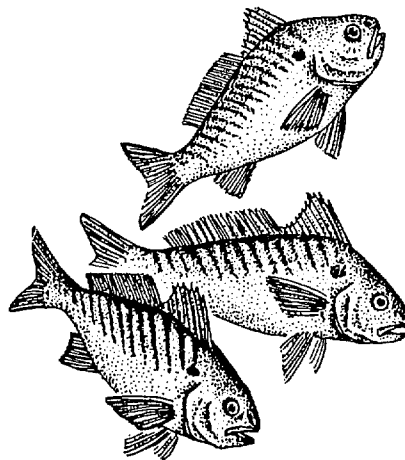
The Subcommittee outlined priority research and management questions which formed the basis for commissioning five technical studies directly related to major information gaps. As part of this activity, the Subcommittee developed a technical peer review system to screen proposals for technical merit, feasibility, and potential utility of results. Recognized experts in appropriate fields throughout the United States performed peer review.

In 1985 the Subcommittee is developing specific work plans for modeling activities. A major goal is to coordinate modeling efforts between various interested states and federal agencies. The Subcommittee also is facilitating coordination of Chesapeake Bay monitoring, modeling, and research efforts, including data management. The Subcommittee will be working with the Monitoring and Data Management Subcommittees to assure that all the Bay Program's technical activities are oriented towards the same goals, and to assure the degree of information sharing necessary for Program success.

Results of monitoring can help guide future research, as well as provide needed data for the development of numerical models. The more intensive focus which directed research can bring to a problem will help explain phenomena observed by the monitoring program. Data resulting from technical studies will be entered into the CBP data base in Annapolis, and will be used to develop useful predictive modeling tools.

Because they represent most agencies which support or conduct technical studies, Subcommittee members can facilitate the integration of all appropriate studies into the CBP effort. An ongoing effort to detail these activities, and to compare them to important management needs, will help identify areas where resources should be focused.

In 1985 the Subcommittee will work with the Scientific and Technical Advisory Committee (STAC) to refine this inventory, and to conduct workshops directing expertise towards specific topics of concern to the Bay community. This information exchange will help direct implementation efforts by providing a sound technical basis for decisions. In 1985, the Subcommittee expects considerable assistance from the STAC in identifying important research needs, and developing appropriate technical coordination and oversight.



The Subcommittee played a major role in setting up the STAC, a group reporting to the Implementation Committee on scientific matters. STAC consists of research managers, such as heads of academic institutions, who can focus considerable resources on specific technical issues. In addition, the Subcommittee has called upon scientists on an *ad hoc* basis to provide detailed briefings on activities such as ongoing modeling efforts and preliminary results of Bay research, etc.

To facilitate coordination of EPA/state research efforts with those of other federal agencies, Subcommittee members participated in drafting Memoranda of Understanding with NOAA and USFWS (p 21). The Subcommittee has reviewed and commented on both the NOAA and the FWS implementation workplans for 1985. The goal is to focus the plans on tasks that are appropriate to each agency, but which also were identified as priority management or research questions. This would include such activities as Baywide finfish stock assessments needed to augment fishery management efforts, a major concern of NOAA, or demonstrating the linkages between alterations in habitat and declines of living resources, concerns of both NOAA and FWS. Both of these had been identified as "high priority" management questions by the Modeling and Research Subcommittee.

This sort of cooperation and integration is needed to direct limited resources towards achieving the maximum benefits from research and other technical activities. The Subcommittee hopes to foster even closer coordination among all the participating agencies, as well as the academic community and other institutions involved with Chesapeake Bay oriented research.

## DATA MANAGEMENT

### The Computer Center

The Chesapeake Bay Program Computer Center in Annapolis is the repository for information concerning the Chesapeake Bay. This center is primarily funded through the U.S. EPA Region III Chesapeake Bay Program (CBP), but its operation is jointly directed through EPA, the states of Maryland, Virginia, and Pennsylvania, the District of Columbia, and several federal agencies. The Data Center services the Bay Program partners for their data processing needs as they relate to the Chesapeake Bay Program.

During the Bay Program Study (1977-1983), approximately 100 million characters of information concerning the Bay were collected and stored on the Bay Program and EPA computers in Annapolis and North Carolina. In late 1983, with the aid of a federal grant, the State of Maryland Office of Environmental Programs purchased a computer for the CBP. This new, larger computer has the greater capacity necessary to support several people running large data analysis programs simultaneously.

The CBP data base now consists of over 600 individual files that contain data on the Chesapeake Bay going back as far as 1907 in some cases. Prior to the Governors' Conference, these data were contained in individual files on the EPA computer in Research Triangle Park, North Carolina. However, specific types of data were difficult to locate and access. When the computer was purchased, these files were moved to the new computer in Annapolis.

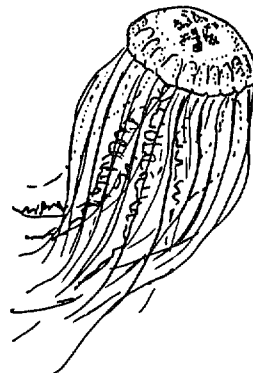
During 1984, the computer staff developed a program called CHESSEE. This on-line, interactive program allows casual or computer literate users to browse through the CBP data base so that information of interest can be located quickly. CHESSEE contains six major areas of interest, each with more detailed options. Four CHESSEE areas (Bay Program, Data Management, Monitoring and Reports) are composed of short text files which contain paragraphs of descriptive documents concerning most aspects of the CBP, its research and findings. The other two key areas (Data Base and Data Dictionary) contain summaries, contents, and means of water quality and living resources data stored in the computer and a dictionary to help users locate data files on specific parameters and stations of interest.

The Data Management Subcommittee (DMS), established in May 1984 by the Implementation Committee, has acted as a bridge between the Implementation Committee, the CBP computer staff (under EPA contract) and the computer users. Through the DMS, guidelines were developed concerning use and access of the computer data base, user support, and acquisition of new equipment and programs. The group assisted in the development of a communications system to allow state users direct access, and helped to revise the Water Quality Data Management Plan developed first by the computer staff.

### System Users

The CBP Computer Center has approximately 100 system users. Over 60 access the system from state terminals. The remainder of the users are EPA, other federal users and citizen groups.

In 1984-85 the computer center was used to support the various activities of the CBP. State agencies used the system to input, verify and analyze the CBP monitoring data. Graphics such as maps, contour plots and graphs were produced to



provide a picture of the quality of the Bay in various locations. State personnel also used the system to run hydrodynamic computer models of the Bay. The computer has helped eligible users obtain information about the Chesapeake Bay Program and provided some information about the origin and meaning of different data sets.

## Support Activities

State users have been provided with continuous on-line support as well as formal training courses and training materials. The DMS has provided support by addressing areas of concern to users. The CBP computer staff has developed computer programs in response to certain user needs. To support research and modeling activities, several models were installed on the computer system and statistical analysis and graphics production were performed.

CBP computer staff has provided presentations, handouts, and on-line computer demonstrations for a number of organizations to summarize various CBP data. Staff has continued to provide data retrieval and limited statistical analysis in support of these requests.

## Enhancements

The CBP Computer Center staff and users have worked together through their respective state and federal agencies to expand the capabilities of the CBP computer center. During the past year, a number of new software programs have been purchased and installed on the system to provide statistical and graphics capabilities for users.

In addition, federal and state users have worked together to acquire needed hardware. The State of Maryland has purchased a large graphics plotter and is currently in the process of purchasing additional disk drives for the CBP Computer Center. EPA provided several important hardware components during the past year. These include a power conditioner which provides

regulated power for the computer system, a series of graphics terminals and a graphics printer. EPA also provided the funds needed to transform a commercial office complex to a facility suitable for computer system operation when the CBP offices and computer center were moved during February 1985.

## CHESAPEAKE BAY RESTORATION AND PROTECTION PLAN

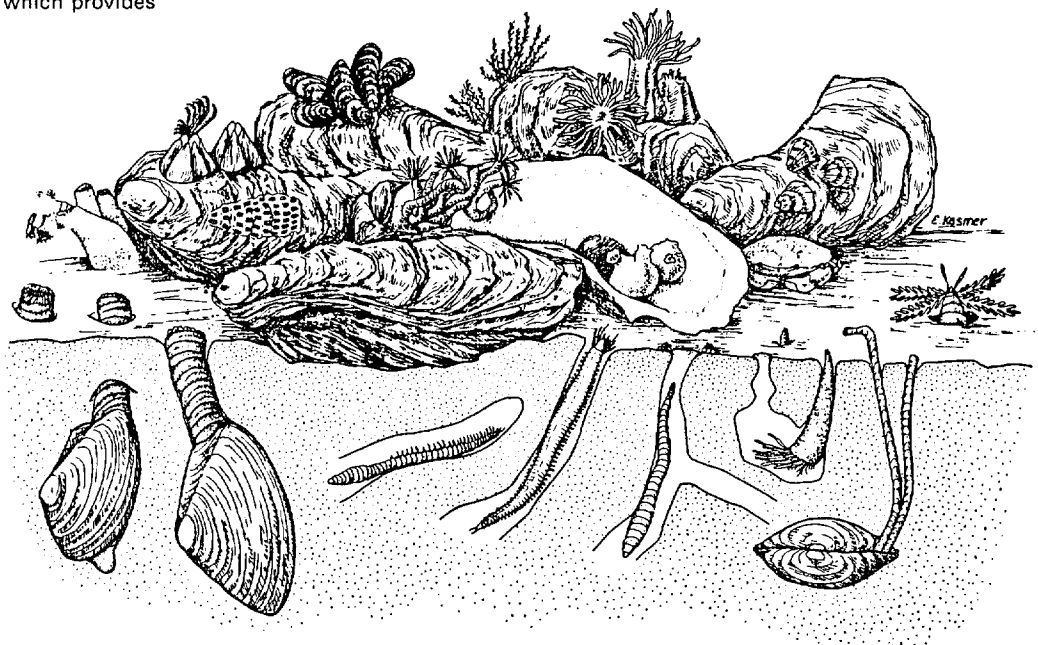
The Chesapeake Bay Agreement of 1983 commits the federal government, the Commonwealths of Pennsylvania and Virginia, the State of Maryland and the District of Columbia to the restoration and protection of the Chesapeake Bay. It pledges the signators to prepare and implement a coordinated plan to restore and protect the waters and the living resources of the Bay.

An effort is now underway to respond to this mandate and develop a Baywide coordinated Plan. Together the state and federal agencies have agreed to goals and objectives for the Bay. The overarching purpose of the Plan is:

"To improve and protect the water quality and living resources of the Chesapeake Bay estuarine system so as to restore and maintain the Bay's ecological integrity, productivity and beneficial uses and to protect public health."

The Plan's purpose is supported by goals which address five areas. For nutrients, the goal is to "reduce point and nonpoint nutrient loadings to attain nutrient and dissolved oxygen concentrations necessary to support the living resources of the Bay."

**"This Plan will become the blueprint for future efforts to restore the Chesapeake Bay."**  
Lee Thomas, EPA Administrator



In the area of toxic substances control the goal is to "reduce or control point and nonpoint sources of toxic materials to attain or maintain levels of toxicants not harmful to humans or living resources of the Bay".

The goal for living resources is to "provide for the restoration and protection of the living resources, their habitats, and ecological relationships".

In the area of institutional and management activities, the goal is to "support and enhance a cooperative approach toward Bay management at all levels of government". The final goal recognizes that the Plan does not touch upon all aspects of management which can affect the Bay. The goal is to "develop and manage related environmental management programs with a concern for their impact on the Bay".

Each of the goals has a series of objectives which describe the approaches planned for specific areas or Baywide use. Finally implementation strategies are explained for each objective. These are the particular program activities which each jurisdiction is implementing to support the objectives.

These activities being carried out by the affected governments in support of the objectives are being identified and compiled. Many of these activities are current and ongoing, based on known needs for the Bay; others are based on probable needs. Some activities involve monitoring and research to uncover new information and to determine if any early remedial actions are producing effects.

The first iteration of the Plan was published in September 1985. Besides being a compilation of activities to achieve the agreed upon goals and objectives, the Plan includes a chapter outlining current efforts to upgrade the major sub-basins of the Bay: the Susquehanna, West Chesapeake, Eastern Shore, Patuxent, Potomac, Rappahannock, York and James.

The final chapter summarizes the implementation programs and some of the anticipated results which the jurisdictions expect to achieve. It also addresses the need for additional research and monitoring to begin to close the data gaps and eliminate uncertainties such as: what are the major limiting nutrients for algal growth in the Bay.

The initial Plan is the first step in a long term strategic planning process. That process is now in the formative stages and the roles to be played by the Executive Council, Implementation Committee, Subcommittees, advisory groups, specific agencies, local governmental units, the academic community, industry and the public have not yet been determined.

In the future, the plan will include longer term commitments. Also, as scientists gain a better understanding of the Bay, the Plan will be modified to reflect that knowledge through new or improved strategies. The restoration and protection process

will be a progressive, cooperative effort. The Chesapeake Bay Agreement committees structure will be used to provide ongoing evaluation of all activities and will assess the overall progress toward meeting the Plan's goals and objectives. A public review process will be an integral part of the Plan's updating and evaluation.

## CITIZEN PARTICIPATION

One of the tasks faced by the Chesapeake Bay Program in 1984 was a redefinition of the purpose and scope of public participation. EPA asked the Citizens Program for Chesapeake Bay (CPCB) to plan a public participation program for the Chesapeake Executive Council. The group has conducted public participation activities for EPA since 1977 and organized the 1983 conference entitled "Choices for the Chesapeake: An Action Agenda".

In February CPCB began to develop a list of potential participants in the planning process and to design a questionnaire to help evaluate past programs and to identify current needs. The questionnaire asked questions about the EPA program, the work of CPCB and priorities for the future.

Using information from the questionnaire as guidance, CPCB organized and conducted a two-day invitational workshop to draft a public participation plan. During the course of the workshop, participants discussed the philosophy and objectives of public participation, the relationships among agencies and between government and the public, and specific tools that make a public participation program work.

Workshop members felt that an independent organization should be involved in producing and distributing information, as well as in coordinating and conducting educational activities. A split on the necessity for advisory committees emphasized the importance of giving careful thought to advisory committees and the need to establish them so they are not another layer of bureaucracy.

The April workshop provided the foundation for the public participation plan. The plan defined six major objectives:

1. Create a Baywide advisory committee;
2. Distribute Bay-related information;
3. Promote public education;
4. Prepare an annual public report;
5. Organize citizen activities on a watershed basis; and
6. Coordinate interstate, interagency public activities.

Many specific tasks were also described in the plan. CPCB presented the plan to the Executive Council which accepted it at its July meeting.

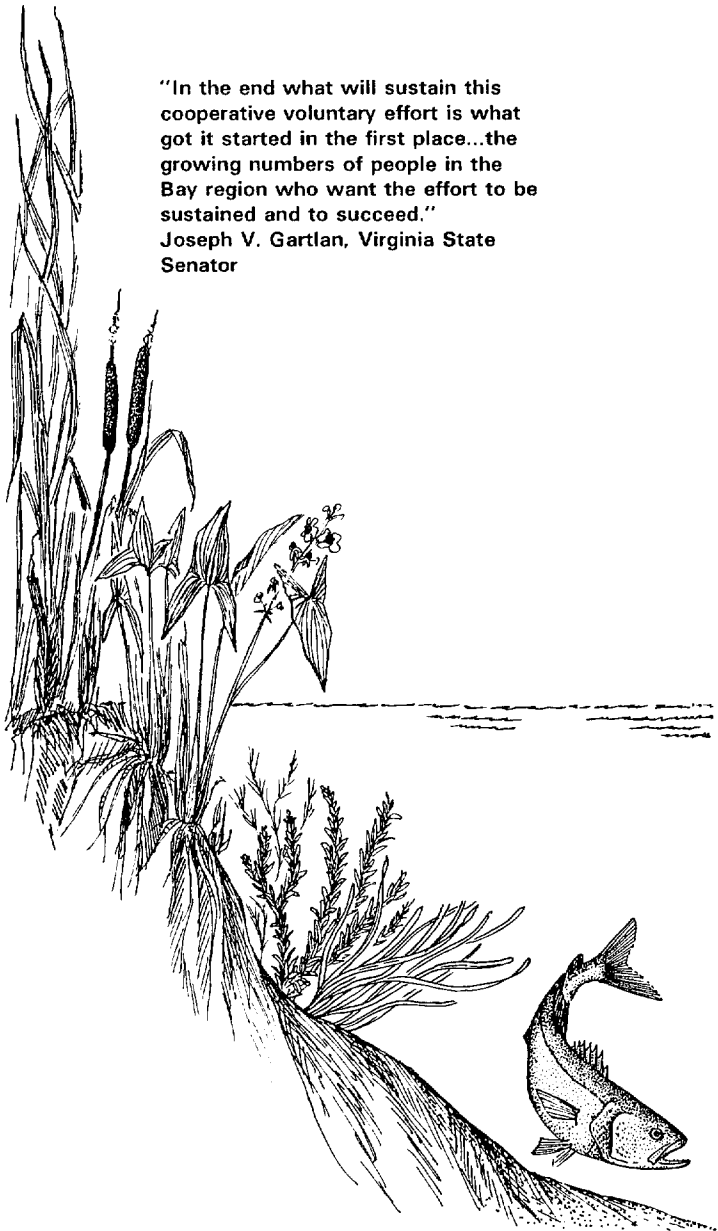
CPCB submitted a proposal to conduct some of the short and long term work outlined in the plan, and in August received a six month grant from EPA Region III. During the latter half of 1984 a number of projects were initiated and some old work continued. Additionally, planning began for some of the more comprehensive work.

At the request of the Executive Council, CPCB developed the purpose and functions of a public advisory committee, researched alternative approaches during the summer and provided specific recommendations to the Implementation Committee in September. These recommendations called for an advisory committee with basic objectives to communicate with affected Bay constituencies and to provide advice and guidance to the Executive Council.

It was agreed that 25 individuals would be appointed, four from each political jurisdiction and nine "at-large." Categories of Bay users to be represented on the committee included agriculture, business and industry, fishing, recreation and conservation. Members were appointed by the

**"In the end what will sustain this cooperative voluntary effort is what got it started in the first place...the growing numbers of people in the Bay region who want the effort to be sustained and to succeed."**

**Joseph V. Gartlan, Virginia State Senator**



Region III Administrator and the first meeting of the CAC was December 13 in Washington, D.C., in conjunction with the ceremony marking the first anniversary of the Chesapeake Bay Agreement.

In the fall of 1984 CPCB researched the feasibility of a citizen monitoring program. Contact was made with about 18 groups having experience in monitoring, and a technical subcommittee met with others interested in the topic to prepare recommendations for EPA. Members concluded that a citizens monitoring program appears feasible and recommended a pilot program in the James and Patuxent rivers.

CPCB co-sponsored a conference with a number of Pennsylvania groups and agencies which was held at Millersville University near Lancaster, Pennsylvania on January 26, 1985. Almost 900 people attended the conference which conveyed two basic messages: to Pennsylvania citizens — your state affects the Bay and there are things that you can do to reduce the pollution that reaches the Bay; to politicians — citizens in your state care about the Bay and want its clean up to be a priority. Follow up activities will be part of the CPCB 1985 program.

In its continuing effort to provide information to the public, CPCB revised and printed a directory of Bay organizations and agencies, and distributed more than 600 copies. A new format was developed for Chesapeake Citizen Report and three issues were distributed. A new information sheet entitled "Baybriefs" was developed to keep people informed of meetings and other events. During the second half of 1984 CPCB made presentations about the Bay Program at 16 public meetings. Films and slides were loaned out 71 times, and hundreds of requests for information, written and verbal, were filled.

Under its 1985 EPA grant the CPCB is expanding its efforts. It has added a staff member based in Virginia, working out of the Council on the Environment offices, to perform public education activities and watershed level participation programs.

In Pennsylvania, CPCB has contracted with three organizations to perform public education concerning the contributions to Bay pollution from Pennsylvania croplands and households. In addition, a full time CPCB citizens monitoring coordinator has been hired to develop and carry out plans reviewed and accepted by the Monitoring Subcommittee on the Patuxent and James rivers.

The CPCB will continue providing support to the Citizens Advisory Committee, producing its information materials, and working with organizations throughout the Bay region to improve public awareness and increase participation in decisions affecting the Chesapeake drainage basin.

# FEDERAL INTERAGENCY COORDINATION

Interagency cooperation and coordination is essential to the success of the implementation phase of the Chesapeake Bay Program. In 1984 federal agencies joined with the State of Maryland, the District of Columbia and the Commonwealths of Virginia and Pennsylvania to expand the partnership in Bay clean-up.

On August 8, 1984 Maryland Senator Charles McC. Mathias, Jr. called a meeting of five federal agencies working on the Chesapeake Bay, the parties to the Bay Agreement and representatives of various involved organizations. The purpose of the meeting was to identify activities which needed greater interagency coordination and suggest ways to improve that coordination.

On September 13, 1984 the Environmental Protection Agency (EPA) and the Department of Defense (DoD) signed a Joint Resolution on Pollution Abatement in the Chesapeake Bay. The DoD pledged to give priority consideration to funding pollution control projects and studies affecting the Bay. There are over 50 DoD facilities on nearly 400,000 acres of land draining into the Bay.

At several of its installations DoD will: develop and initiate environmental self-auditing, review existing land management practices and take action to reduce soil erosion and other nonpoint source pollution, and will review its design, construction and maintenance management practices.

**"This is a historic landmark. These agreements symbolize the reversal of years of neglect."**  
Charles McC Mathias Jr., United States Senator, Maryland

By November the EPA Chesapeake Bay Liaison Office had negotiated Memoranda of Understanding (MOU) with the US Fish & Wildlife Service (F&WS), the Soil Conservation Service (SCS), the National Oceanic and Atmospheric Administration (NOAA), the US Army Corps of Engineers (COE), and the US Geological Survey (USGS). These MOUs will provide the means to better coordinate federal Chesapeake Bay efforts and direct them toward accomplishing the objectives of the Bay Agreement.

All of the MOU agencies pledge cooperation in areas of mutual interest and support of the goals of the Chesapeake Bay Agreement. There are several other common points in all the MOUs and they are reflected in the table below.

Specifics differ between agreements because the expertise of the agencies differs. For example, the SCS will help train state and federal agencies' personnel in the application of best management practices to control nonpoint source pollution from agricultural lands. The agency added ten staff people to the cleanup effort in fiscal year 1985 and assigned one person to the Chesapeake Bay Liaison Office in Annapolis for coordination purposes. NOAA will work with EPA in monitoring trends in the Bay. With a \$1.5 million appropriation, NOAA will work to improve fisheries statistics, conduct assessments of stocks of the Bay fisheries, and will enter all the information it has concerning the Bay into the EPA data base. USGS will work with other agencies in developing mapping techniques and evaluating the impacts of groundwater pollution on the Bay. F&WS will work with other agencies to evaluate certain wetlands activities and assist with monitoring trends of contaminants in fish. The Corps will provide particular help with modeling the Bay and tributaries, and work with other agencies while conducting its recently authorized Chesapeake Bay Erosion Control Study.

## Provisions Common to All MOUs

ITEM	F&WS	SCS	COE	USGS	NOAA
Representation on Implementation Committee	ex- officio	X	X		X
Serve on Subcommittees	X	X	X	X	X
Provide Annual Workplan	X	X		X	X
Provide Expertise	X	X	X	X	X
Monitoring Activities	X			X	X
Data Provision & Management	X		X	X	X

# OUTLOOK

Stemming the decline of the Chesapeake Bay ecosystem will be difficult. Reversing the trends will be an even greater challenge. It is very likely that our currently increasing population, the level of deforestation, the existing alteration of the shoreline, our present fisheries harvesting efforts and farming practices will severely limit the level of recovery we can expect. Regardless of the extensive clean up efforts which governments, industries and individuals have implemented and will maintain or expand, it will not be possible to recreate the Chesapeake Bay of Captain John Smith's days.

However, we can and must return to the more favorable conditions that existed earlier in this century when more robust fisheries produced substantially higher yields than today. We can look forward to clearer waters with healthier plankton, less fear of contamination from human pathogens, and a return to more abundant beds of submerged aquatic vegetation.

Restoration will take time. The Bay has a "memory" of what has happened to it, particularly in its sediments. However, it is likely that many elements of the restoration can proceed and begin to produce results, perhaps at about the same rate that it took to degrade the Bay system. This suggests that long term strategies and long term commitments are vital if water quality and living resources in the Bay are truly to be restored and protected.

Programs to reduce current and control current and future nutrient loadings to the Bay system are in place and being expanded. They will produce results, but today scientists cannot accurately predict how quickly or extensively the Bay will respond. Nor can they predict with confidence the cumulative reductions of toxic materials loadings to the Bay which current and proposed initiatives will produce. Mathematical models currently being

developed should assist scientists and regulators in predicting the reductions that can be expected in the future.

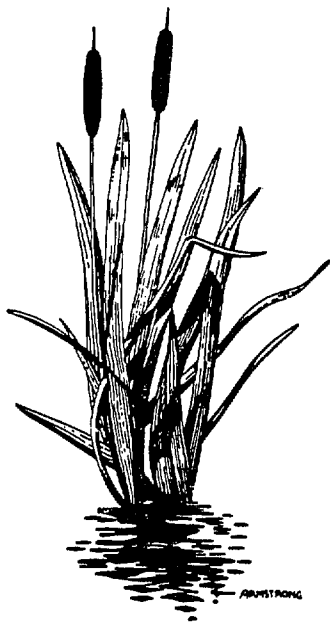
The regulatory community is certain that significant reductions in loadings of toxic contaminants will occur through point source control programs. Future control technologies will also result in loadings reductions. Stormwater management and the installation of best management practices on urban and agricultural lands will reduce the flow of toxic substances and nutrients into the Bay and its tributaries.

Mid-course corrections will be made in control programs as necessary. The results of research projects and the effects control efforts produce will influence the structure and character of future programs. Improved understanding of the fate and effects of toxic materials will improve the ability of scientists and regulators to assure that we attain or maintain levels which are not harmful to humans or living resources.

Several research and management questions remain to be answered. The precise impacts and extents of nutrient enrichment and toxic substances contamination in the Chesapeake Bay are still to be defined. We also cannot state with confidence the specific numerical objectives which must be achieved in the Bay and its tributary waters if we are to protect the water/sediment quality and living resources of the Bay for future generations.

Enough information was known and understood to accelerate Bay protection and rehabilitation efforts. Much more needs to be done and will be. Strategies used today may be changed over the next several years.

"State of the Bay" documents will provide the overview of programs and their effects on the Bay system. In future years, this publication will report the trends in the Bay and its tributaries as discovered through analysis of monitoring data, results of specific programs and projects, changes in state, federal and local programs because of new research findings, the successful use of specific best management practices, clean up measures and education efforts.



**"One thing we have to guard against is impatience. It has taken years to pollute the Chesapeake Bay; it will take years to clean it up. Each of us must make the tough decisions required today. We cannot be discouraged if our efforts do not show immediate results. If we are persistent, we will get those results — a cleaner Bay and the restoration of its living resources."**

**James M. Seif, EPA Region III  
Administrator**